

Luis Xavier Santos¹, Vera Chéroux¹, Pedro Cebola¹, André Almeida^{1,2}, Orlando Fernandes³, Carlos Família^{1,2}, Sérgio Félix^{1,2}, Catarina Godinho^{1,2,3}

¹- Instituto Superior de Ciências da Saúde Egas Moniz (ISCSEM), Quinta da Granja, Monte de Caparica, 2829-511 Caparica, Portugal.

² Centro de Investigação Interdisciplinar Egas Moniz (CiiEM), Cooperativa de Ensino Superior, C.R.L., Quinta da Granja, Monte de Caparica, 2829-511 Caparica, Portugal.

³ Escola Superior de Saúde Egas Moniz, (ESSEM), Quinta da Granja, Monte de Caparica, 2829-511 Caparica, Portugal.

INTRODUCTION: The use of intraoral removable devices can lead to postural corrections through stomatognathic system information sent to the central nervous system, which interprets and sends to the muscle groups a neuromuscular response (1). This can bring benefits for golf athletes, because this sport requires a high postural control and its income dependent directly from the correct alignment of body segments and their dynamic relationship. The aim of this work was to analyze whether the use of an intraoral device (IOD), totally adapted, in centric relation, causes changes in static posture.

MATERIALS AND METHODS: After study approval by the Ethic Commission of the Cooperativa de Ensino Superior Egas Moniz, athletes from the Centro Nacional de Formação de Golfe do Jamor (CNFGJ - Fig.1) were invited to participate in this study. After obtaining consent, an oral clinical observation was performed with the application of the Diagnostic Criteria for Temporomandibular Disorder (TMD). Individualized and equilibrated intraoral removable devices were developed for each athlete (Fig.2). The postural parameters of each athlete were collected using a pressure platform (RsScan – Fig.3) in four random conditions: eyes open and eyes closed, with and without IOD. The athletes performed 3 repetitions of each condition for 66 seconds each. We analyzed the centre of pressure (CP) sway velocity. Linear mixed models were used to analyze the effects of the utilization of the intraoral device and the CP velocity. The significance of these effects was accessed through a type III analysis of variance with Kenward-Roger approximation for the degrees of freedom.



FIGURE 1 - Centro Nacional de Formação de Golfe do Jamor – Lisboa (CNFGJ).



FIGURE 2 - IOD after obtaining Centric Relation and occlusal adjustments

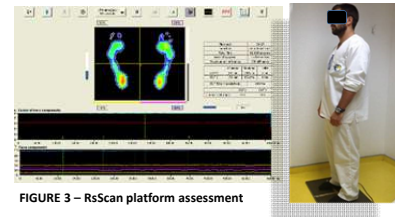
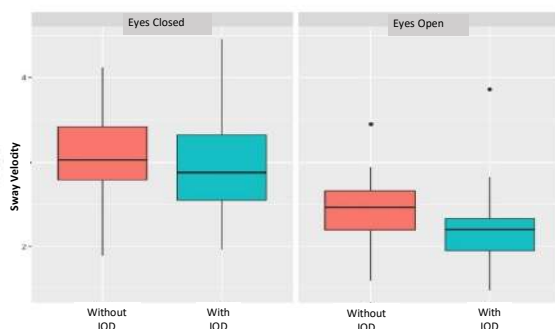
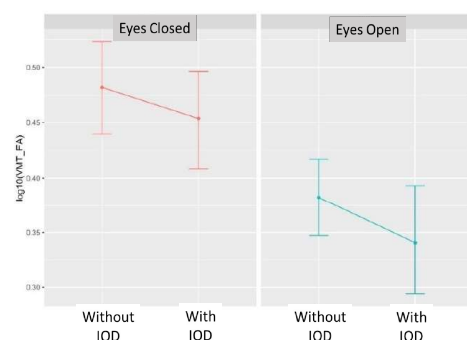


FIGURE 3 – RsScan platform assessment

RESULTS: There was included in this study 17 Golf athletes, 15 men and 2 women with a mean age of 26.2 (± 6.74) years. The developed model was significantly different from the null model ($\chi^2(3) = 32.344$, $p \leq 4.428e-07$). Analysis of variance shows that both, the effect of intraoral device and the effect of the presence of visual information influenced the model ($F(1,45) = 4.235$, $p \leq 0.04542$ e $F(1,45) = 38.895$, $p \leq 1.39e-07$, respectively) for a level of significance of ≤ 0.05 (Graph 1 and 2).



GRAPH 1: Box plot Graph of quartiles related to centre of pressure Sway Velocity with and without the use of the IOD with eyes closed and eyes open.



GRAPH 2: Main effects of the use of IOD and eyes closed and eyes open relative to centre of pressure Sway Velocity

DISCUSSION AND CONCLUSION: The use of intraoral devices in our sample positively influenced the posture of this athletes, showing the interconnection of the stomatognathic system with the muscular system in balance control, through the neuromuscular responses sent by the central nervous system.

References:

(1) - Okeson, J. P. (2013). Management of Temporomandibular Disorders and Occlusion (Vol. 7th).

(2) - Pae, A., Yoo, R., Noh, K., Paek, J., & Kwon, K.-R. (2013). The effects of mouthguards on the athletic ability of professional golfers. Dental Traumatology, (29), 47-51. <http://doi.org/10.1111/j.1600-9657.2012.01123>.

Acknowledgments: The authors would like to acknowledge all the athletes and collaborators at the CNFGJ